STAT [redacted]

ELECTROPHOTOGRAPHIC PROCESSING TECHNIQUES

STAT CONTRACT [redacted] TASK ORDER NO. 03(100,762)65-R

Monthly Narrative Report - July 1965

This is the first of a series of monthly narrative reports on a study of electrophotographic processing techniques. The study covers the investigation and development of photographic and electronic techniques for processing photographic images. This report covers the work performed by the [redacted] STAT
STAT [redacted] during the period from 22 June to 22 July 1965. (Project personnel participated in a two-week Division shutdown for vacation beginning 17 July 1965.)

A. Current Status of Work

1. Photographic Processing

The key to photographic processing will be control of acutance (a measure of edge sharpness) and granularity (a measure of graininess) by adjustment of density thresholds, expansion and contraction of densities, and variation of the illuminating spot from a modulated-light source. Most of the special test equipment required to perform these tasks has been specified and ordered. Also, approval has been obtained for the construction of improved facilities (i.e., a new and improved photographic laboratory) to be completed by mid-August.

In anticipation of early equipment delivery (within the next month), a preliminary review of pertinent film characteristics was begun. Photographic film, processing chemicals, and laboratory supplies are among the miscellaneous materials purchased during the period.

The design of the modulated-light contact printer is nearly completed, and specification and ordering of parts have begun. In brief, the raster from a flying-spot scanner tube will be imaged onto the test negative or transparency held in contact with a copy film. With the aid of a partially-reflecting mirror, transmitted light will be condensed onto a photomultiplier tube for feedback pickup and imaged onto a Fresnel screen for observation. The observation station will be utilized during the set-up procedure.

2. Electronic Processing

The key to electronic processing, analogous to photographic processing, will be separate and simultaneous operation on the high and low frequency information in the photographic images. Equipment is being assembled to evaluate critical aspects of the two-kinescope system proposed in [redacted] Proposal No. 915908-B. (Some of the high-resolution components of this system have a four-month delivery time.) STAT

The initial breadboard setup, which is near completion, will consist of two five-inch kinescopes, two 45-degree front-surfaced mirrors, a single projection lens, a transparency holder arranged for contact printing, and a sensor employing a condensing Fresnel lens and a photomultiplier tube. The video equipment includes existing 20-megacycle amplifiers.

B. Problem Areas Encountered

1. Photographic Processing

In connection with the modulated-light contact printer, it may not be possible during the set-up procedure to duplicate the effect of the copy film's anti-halation backing with a neutral filter. Set-up may have to be performed with only the negative in position, thereby necessitating the use of a compensating factor for the copy film to be inserted for actual exposure.

2. Electronic Processing

The main concern for the proposed electronic processing system is with system stability. The extent to which optical filters can separate components of light from the two kinescope phosphors (i.e., the feasibility of achieving stability with full video gain for both positive and negative masking) will be determined as soon as possible.

C. Projected Work for Next Monthly Period

1. Photographic Processing

a. Preparation of calibration and standardization specifications for special test equipment.

b. Performance of photometric/densitometric measurements as related to the test equipment.

c. Measurement of the edge gradient responses of preselected films.

d. Continued development of the modulated-light contact printer.

2. Electronic Processing

a. Completion of the initial breadboard setup.

b. Quantitative checkout of the initial breadboard setup.

D. Status of Fund Expenditures to End of Monthly Period

Total funds expended to 25 July 1965 [redacted] STAT

E. Documentation of Verbal Commitments and/or Agreements during the Period

The Technical Representative of the Contracting Officer agreed to forward sample transparencies for evaluation as soon as possible.